

Remarks:

A Notice of Abandonment was issued by the Patent Office on December 15, 2005, due to Applicant's failure to timely file a proper Reply. A Petition to Revive the Application has been prepared and the present Response is submitted with the filing of the Petition.

The Examiner objects to the appearance of handwritten numbers next to the equations on pages 11-17 of the specification. Applicant is unsure of the origin of those markings as they do not appear on the Applicant's retained copy. However, they copy reviewed from the USPTO's PAIR system indicates the presence of those markings. It appears someone marked the equations in anticipation of printing, however that is not certain. In any event, the markings should not be present and Applicant hereby submits a replacement specification. The replacement specification includes the correction in Equation 12 identified and requested by the Examiner, in which the subscript "TTL" is added to the factor Z. It is worth noting the handwritten markings do not appear on the published application.

Claims 1-43 are pending in the application. Claims 3, 4, 11, 14, 24, and 29 are cancelled by way of the present amendment. Applicant acknowledges and appreciates the Examiner's indication that dependent claim 39 contains allowable subject matter.

The Office Action indicates several objections to claims due to informalities. Each of these objections is believed to have been addressed by the present Amendment. Withdrawal of these objections is respectfully requested.

Claims 1, 2, 10, 18, 22, and 23 are rejected under 35 U.S.C. 102(b), as being anticipated by Zhou (EP 0648342). The remaining claims are rejected under 35 U.S.C. 103(a), as being unpatentable over Zhou (EP 0648342), in view of one or more of Zuschlag (U.S. Patent No. 2,519,094), Bittar '609 (U.S. Patent No. 6,476,609), Gao, et al. (U.S. Patent No. 6,393,364), Twist (U.S. Patent No. 5,159,577), and Bittar '842 (U.S. Patent No. 6,218,842).

Dependent claims 11-14 are rejected under 36 U.S.C. 103(a), as being unpatentable over Zhou in view of Bittar '609. Applicant respectfully traverses these obviousness rejections and similarly based rejections of claims 26-29. Dependent claim 11 further recites "step (c) further comprising producing a corrected signal and comparing the corrected signal with a calculated signal." Thus, the method claim provides the following sequence of steps:

- measuring a signal affected by the test loop
- producing a corrected signal

- comparing the corrected signal to a calculated signal.

The Examiner cites Bittar '609 as disclosing the steps of "producing the corrected signal and comparing the corrected signal with a calculated signal." In FIG. 8 of Bittar '609, a process is illustrated for obtaining horizontal resistivity, vertical resistivity, and relative dip angle of an earth formation. Upon a review of the text specifically cited by the Examiner (col. 12, lines 4-6 and lines 34-44) and FIG. 8, Bittar '609 appears to teach the following sequence of steps:

- first, calculating resistivities, *i.e.*, theoretical "induced" voltages, V1 and V2
- obtaining the "computed resistivities" from the calculated theoretical "induced" voltages
- comparing the computed resistivities to the measured resistivities

The above sequence of steps is different from that recited by the claimed invention. Bittar '609 does not teach or suggest, among other elements, the step of comparing a corrected signal to a calculated signal. In fact, the last step may be construed as comparing a calculated signal to a measured signal.

Previously, claim 14 depended from claim 11 and further recited "wherein the calculated signal is based on a model including the electromagnetic logging tool and the test loop." Neither Bittar '609 nor Zhou teaches or suggests comparing a corrected signal to a "calculated signal based on a model including the electromagnetic logging tool and a test loop."

Accordingly, the combination of Bittar '609 and Zhou does not produce the claimed invention. Each of the rejections of claims 11-14 (and claims 26-29) based on this combination of references is, therefore, improper.

Claim 1 has been amended to incorporate the subject matter previously recited in claims 11 and 14. For the reasons set forth above, amended claim 1 is patentable over the cited references. Dependent claims 2, 5-10, 12-13, and 15-17 depend from amended claim 1. Each of these dependent claims is also patentable over the cited references.

Claims 3, 24, and 37 are rejected as being unpatentable over Zhou, in view of Zuschlag. Applicant respectfully traverses those rejections, however Applicant hereby cancels claim 3. Dependent claim 24 further recites that the processor in claim 18 is "adapted to calculate said signal correction using a signal induced at said antenna without any effect associated with the test

loop.” Applicant submits that the combination of Zhou and Zuschlag provides an improper basis for a section 103 nonobviousness rejection of claim 18.

First, the Zuschlag reference is directed to an apparatus for detecting magnetic disturbances, which utilizes a pair of rotatable coils in conjunction with a stationary calibration coil. The Zuschlag apparatus and the problems it appears to try to address are not particularly adaptable (*i.e.*, non-analogous) to the drilling environment and the field measurement (formation evaluation) problems which are addressed by Zhou or in the present invention. Thus, one skilled in the art is not likely to seek out the Zuschlag reference for solutions to drilling and formation evaluation problems. This is especially true given the abundance and wealth of technical literature, current developments, and patent publications specifically directed to these problems. This abundance of primary references highlights how remote the Zuschlag reference may be to one concerned with the problems associated with the use of electromagnetic induction tools in formation evaluation. Secondly, the Zuschlag reference was published more than half a century ago, and thus, may be considered outdated in view of more recent advances in the drilling and formation evaluation art, and the availability of literature and information on these advances. Thirdly, the apparatus proposed in Zuschlag uses a pair of rotatable coils and a stationary calibration coil, which system is structurally and functionally different from those of Zhou and the present invention. The technical basis for any calibration method taught in Zuschlag would perhaps appear to one faced with the problems presented in Zhou, to be inapplicable to the electromagnetic logging tools of Zhou or the present invention.

The above-listed combination of factors makes it highly unlikely that one skilled in the art would look to and extract information from this reference and apply that information or teaching upon the teaching of Zhou to produce the subject matter of the present invention. Accordingly, applicant submits that the combination of prior art references suggested by the Examiner does not establish a proper basis for a §103 obviousness rejection.

In any event (and as further support of the above arguments), the processor recited in claim 24 is adapted to calculate a signal correction using a signal induced at the antenna without any effect associated with the test loop. As revealed in Zuschlag (see last paragraph of col. 4 through the first and second paragraph of col. 5), the stationary calibration coil 37 is initially in a disconnect mode due to an open switch. With the calibration coil 37 in this disconnect mode,